Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

Operator's Manual

CERES Inversion to Instantaneous Top-of-Atmosphere (TOA) Fluxes and Empirical Estimates of the Surface Radiation Budget (Subsystems 4.5 and 4.6)

CER4.5-6.1P1
CER4.5-6.2P1

Release 2

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Preface

The Clouds and the Earth's Radiant Energy System (CERES) Data Management System supports the data processing needs of the CERES Science Team research to increase understanding of the Earth's climate and radiant environment. The CERES Data Management Team works with the CERES Science Team to develop the software necessary to support the science algorithms. This software, being developed to operate at the Langley Distributed Active Archive Center (DAAC), produces an extensive set of science data products.

The Data Management System consists of 12 subsystems; each subsystem represents one or more stand-alone executable programs. Each subsystem executes when all of its required input data sets are available and produces one or more archival science products.

This Operator's Manual is written for the data processing operations staff at the Langley DAAC by the Data Management Team responsible for this Subsystem. Each volume describes all Product Generation Executables for a particular subsystem and contains the Runtime Parameters, Production Request Parameters, the required inputs, the steps used to execute, and the expected outputs for each executable included within this Subsystem. In addition, all subsystem error messages and subsequent actions required by the DAAC operations staff are included.

Acknowledgment is given to Yvonne M. Seaman and Waldena Banks of Science Applications International Corporation (SAIC) for their support in the preparation of this document and to Maria Vallas Mitchum, NASA, LaRC and Sandra K. Nolan, SAIC, for structuring the manual guidelines and organization.

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Introduction

The Clouds and the Earth's Radiant Energy System (CERES) is a key component of the Earth Observing System (EOS). The CERES instrument provides radiometric measurements of the Earth's atmosphere from three broadband channels: a shortwave channel (0.3 - 5 µm), a total channel (0.3 - 200 µm), and an infrared window channel (8 - 12 µm). The CERES instruments are improved models of the Earth Radiation Budget Experiment (ERBE) scanner instruments, which operated from 1984 through 1990 on the National Aeronautics and Space Administration's (NASA) Earth Radiation Budget Satellite (ERBS) and on the National Oceanic and Atmospheric Administration's (NOAA) operational weather satellites NOAA-9 and NOAA-10. The strategy of flying instruments on Sun-synchronous, polar orbiting satellites, such as NOAA-9 and NOAA-10, simultaneously with instruments on satellites that have precessing orbits in lower inclinations, such as ERBS, was successfully developed in ERBE to reduce time sampling errors. CERES continues that strategy by flying instruments on the polar orbiting EOS platforms simultaneously with an instrument on the Tropical Rainfall Measuring Mission (TRMM) spacecraft, which has an orbital inclination of 35 degrees. In addition, to reduce the uncertainty in data interpretation and to improve the consistency between the cloud parameters and the radiation fields, CERES includes cloud imager data and other atmospheric parameters. The CERES instruments fly on the TRMM spacecraft, on the EOS-AM platforms and on the EOS-PM platforms. The TRMM satellite carries one CERES instrument while the EOS satellites carry two CERES instruments, one operating in a fixed azimuth scanning mode and the other operating in a rotating azimuth scanning mode.

Document Overview

This document, <u>CERES Inversion to Instantaneous Top-of-Atmosphere (TOA) Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Release 2 Operator's Manual</u>, is part of the CERES Subsystems 4.5 and 4.6 Release 2 delivery package provided to the Langley Distributed Active Archive Center (DAAC). It provides a description of the CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Release 2 software and explains the procedures for executing the software. A description of acronyms and abbreviations is provided in Appendix A, a comprehensive list of messages that can be generated during the execution of Product Generation Executives (PGE), CER4.5-6.1P1 and CER4.5-6.2P1, is contained in Appendix B, and Input File Listings are provided in Appendix C.

This document is organized as follows:

Introduction
Document Overview
Subsystem Overview
1.0 Detailed Description of PGE: CER4.5-6.1P1
2.0 Detailed Description of PGE: CER4.5-6.2P1
Appendix A - Acronyms and Abbreviations
Appendix B - Error Messages
Appendix C - Input File Listing

Subsystem Overview

CER4.5-6.1P1 - CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor

The Main Processor converts CERES filtered radiance measurements to instantaneous radiative flux estimates at the top of the Earth's atmosphere and produces radiative flux estimates at the Earth's surface for each CERES footprint.

CERES Inversion Subsystem 4.5 calculates estimates of the radiant flux at the TOA based on input from the Preliminary Single Satellite Footprint (PRE_SSF) produced by the Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function (PSF) Subsystem 4.4. This inversion process is dependent on several factors, including Earth surface features; the extent of cloudiness; and the relative geometry of the spacecraft, the Sun, and the measurement field-of-view. Each radiometric measurement is spectrally corrected to give an unfiltered measurement. Estimates of the radiant flux at the TOA are computed based on scene information, geometrical considerations, and the unfiltered measurements.

Surface Flux Estimation, Subsystem 4.6, calculates estimates of radiant flux at the Earth's surface based on TOA fluxes calculated in Subsystem 4.5. Additional input data required by Subsystem 4.6 include precipitable water, surface emissivity, and cloud properties from the PRE_SSF. Pressure, temperature, and humidity profiles are from a Meteorological, Ozone, and Aerosol (MOA) Product. Model A Shortwave (SW) net and downward surface fluxes are estimated using the Li-Leighton algorithm. Model B SW downward surface fluxes are estimated using the Staylor algorithm. Model A Longwave (LW) net and downward surface fluxes are estimated using the Ramanathan-Inamdar Algorithm. Model B LW net and downward surface fluxes are estimated using the Gupta Algorithm.

The output of Subsystems 4.5 and 4.6 Main Processor consists of a binary Single Satellite Footprint (SSF) product, which serves as input for CERES Subsystems 5.0 and 9.0, an ASCII Quality Control (QC) report, and a binary QC file.

CER4.5-6.2P1 - CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Postprocessor

The Postprocessor reads the binary SSF product as input and generates an SSF product in Hierarchical Data Format (HDF).

1.0 PGEName: CER4.5-6.1P1

CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor

1.1 PGE Details

1.1.1 Responsible Persons

Table 1-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Sandy Nolan	Carla Franklin
Organization	SAIC	SAIC
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	827-4652	827-4657
Fax	825-4968	825-4968
LaRC email	s.k.nolan@larc.nasa.gov	c.b.franklin@larc.nasa.gov

1.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 1-1.

1.1.3 Parent PGE(s)

Table 1-2. Parent PGEs for CER4.5-6.1P1

PGEName	Description
CER4.1-4.1P1	Cloud Property Retrieval and Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function
CER12.1P1	Regrid Humidity and Temperature Fields Processor (MOA Product)

1.1.4 Target PGE(s)

Table 1-3. Target PGEs after CER4.5-6.1P1

PGEName	Description
CER4.5-6.2P1	Postprocessor for SSF HDF Generation
CER5.1P1	Compute Surface and Atmospheric Radiative Fluxes
CER9.2P1	Grid TOA and Surface Fluxes

1.2 Operating Environment

1.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 1-4. Runtime Parameters for CER4.5-6.1P1

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	00 .. 23

1.2.2 Environment Script Requirements

Reference "Proposal for Semi-Automated Sampling Strategy, Production Strategy, and Configuration Code Implementation" internal paper for detailed description of the CERES environment parameters. URL:http://asd-www.larc.nasa.gov/ceres/intern_doc/

One Environment Script is required. It is named '**ENVinversion-env.csh**' and contains the following parameters:

        SS4_4   - Sampling Strategy for Clouds (Cookiecutter), see Production Request
        SS12   - Sampling Strategy for RegridMOA, see Production Request
        SS4_5   - Sampling Strategy for Inversion, see Production Request
        PS4_1   - Production Strategy for Clouds, see Production Request
        PS12   - Production Strategy for RegridMOA, see Production Request
        PS4_5   - Production Strategy for Inversion, see Production Request
        CC4_1   - Configuration Code for Clouds, see CM Database
        CC12   - Configuration Code for RegridMOA, see CM Database
        CC4_5   - Configuration Code for Inversion, see CM Database

1.2.3 Execution Frequency (daily,hourly,..)

hourly (1/hr) - This PGE is to be processed once per data-hour, a maximum total of 744 hours per month, when input is available.

1.2.4 Memory/Disk Space/Time Requirements

Memory: 4464 K
Disk Space: 435 Megabytes
Total Run Time: 12:42 minutes

1.2.5 Restrictions Imposed in Processing Order

None, process when Input Data are available, (see Section 1.3).

1.3 Processor Dependencies (Previous PGEs, Ingest Data,..)

1.3.1 Input Dataset Name (#1): SSFI

a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

   **$CERESHOME/clouds/data/out_comp/data/SSF_Int/
   CER_SSFI_$SS4_4_$PS4_1_$CC4_1.YYYYMMDDHH**

   1. Mandatory/Optional: **This file is Mandatory**
   2. Time Related Dependency:

      The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

   3. Waiting Period: **None, Process when all input data are available.**

b. Source of Information (Source is PGE name or Ingest Source):

   Source PGE: CER4.1-4.1P1

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **Remove**

e. Typical file size (MB): **203**

1.3.2 Input Dataset Name (#2): FQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

   $CERESHOME/clouds/data/out_comp/QA_Reports/
   CER_FQCI_$SS4_4_$PS4_1_$CC4_1.YYYYMMDDHH

   1. Mandatory/Optional: **This file is Mandatory**

   2. Time Related Dependency:

      The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

   3. Waiting Period: **None, Process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

   Source PGE: CER4.1-4.1P1

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution: **Remove**

e. Typical file size (MB): **.10**

1.3.3 Input Dataset Name(#3): MOA

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

   $CERESHOME/sarb/data/out_comp/data/regridmoa/
   CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH
   CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH.met

   1. Mandatory/Optional: **This file is Mandatory**

   2. Time Related Dependency:

      The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

   3. Waiting Period: **None, Process when all input data are available.**

b. Source of Information (Source PGE name or Ingest Source):

   Source PGE: CER12.1P1

c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

d. File Disposition after successful execution:

   Do not remove, will be needed for other PGE(s)

e. Typical file size (MB): **13.31**

1.4 Operating Procedures (Procedure for each part of the processor's elements)

The Main Processor production script, run_4.5-6.1P1, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the inversion-specific environment script, ENVinversion-env.csh, then executing an ASCII file generator, ascii_gen_4.5-6.1P1, and the PCF generator, pcfgen_4.5-6.1P1.

1.4.1 How to Generate the ASCII File

The ASCII file generator requires four command line arguments: 4-digit year (YYYY), 2-digit month (MM), 2-digit day (DD), and 2-digit hour-of-day (HH).

At the command line (>) type:

> **> cd $CERESHOME/inversion/bin**
> **> source $CERESHOME/inversion/bin/ENVinversion-env.csh**
> **> $CERESHOME/inversion/bin/ascii_gen_4.5-6.1P1 YYYY MM DD HH**

The following file will be generated in **$CERESHOME/inversion/rcf/**:

> **CER4.5-6.1P1_PCFin_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

1.4.2 How to Generate the PCF File

The PCF generator, pcfgen_4.5-6.1P1, is executed using the newly created ASCII input file name as a command line argument.

At the command line (>) type:

> **> $CERESHOME/inversion/bin/pcfgen_4.5-6.1P1 CER4.5-6.1P1_**
> **PCFin_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

The following PCF will be generated in **$CERESHOME/inversion/rcf/**:

> **CER4.5-6.1P1_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

1.4.3 How to Execute the Main Processor

Execute the production script by typing the script name, run_4.5-6.1P1, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."DataDate".   The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day, and HH is the 2-digit hour-of-day.

At the command line (>) type:

>**cd $CERESHOME/inversion/bin**
>**$CERESHOME/inversion/bin/run_4.5-6.1P1**
$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

1.4.4 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

1.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script has been designed to check for these files and delete them prior to execution, but in the case of a change in the file permission status, the DAAC must take appropriate action. These files must be removed before reprocessing.

1.5 Execution Evaluation

1.5.1 Exit Codes

The processor CER4.5-6.1P1 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 1-5. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Table 1-1) for assistance.

Table 1-5. Exit Codes for CER4.5-6.1P1

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see Appendix B).

1.5.2 Screen Messages (Use Table format for large number of messages)

When running the production script, run_4.5-6.1P1, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

1.5.3 Log and Status Files Results (Include <u>ALL</u> Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/inversion/data/runlogs**.

1. Report Log File: CER4.5-6.1P1_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Report Log File contains the Inversion related messages. These messages may be strictly informative (Error Type = Status or Warning) or may indicate a fatal condition that results in premature PGE termination (Error Type = Fatal). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in Appendix B.

2. Status Log File: CER4.5-6.1P1_LogStatus_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '_F_', fatal message type. The responsible person should be advised.

3. User Log File: CER4.5-6.1P1_LogUser_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically the _U_ and _N_ (User information and Notice) will be written to User Log File and Status Log File.

1.5.4 Solutions to Possible Problems

As mentioned in Section 1.4.5, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the DAAC must take appropriate action. These files must be removed before reprocessing.

1.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

    a. Subsystem Termination

      There are no foreseeable Subsystem terminating conditions at this time. If one hour fails, continue processing the next hour.

    b. Target PGE Termination

      If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

1.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 744 times, maximum, in a 31 day month.

Table 1-6. Expected Output File Listing for CER4.5-6.1P1

If "(**.met**)" is written next to an expected Output Filename in the following table, then the metatdata file **must** exist with the identical file name and .met extension.

File Name/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination
CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met) @($CERESHOME/inversion/data/out_comp/data)	m	189.30	1/hr	CER4.5-6.2P1 CER5.1P1 CER9.2P1	Archive, /QA(VD)
CER_GQCI_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met) @($CERESHOME/inversion/data/out_comp/QC)	m	.10	1/hr	N/A	Archive, /QA,rm
CER_GQCA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met) @($CERESHOME/inversion/data/out_comp/QC)	m	.02	1/hr	N/A	Archive, /QA,rm

Note: VD   - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)
/QA   - File is to be written to the DAAC designated /QA directory
hr   - data hour
rm   - remove
YYYY   - 4 digit year
MM   - 2 digit month {valid values: 01 .. 12}
DD   - 2 digit day {valid values: 01 .. 31
HH   - 2 digit hour of the day {valid values: 00 .. 23}
m   - mandatory output
o   - optional output

1.7 Expected Temporary Files/Directories.

Table 1-7. Temporary Files Listing for CER4.5-6.1P1

Directory	File Name
$CERESHOME/inversion/data/scr	MCFWrite.temp

2.0 PGE Name: CER4.5-6.2P1

CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Postprocessor

2.1 PGE Details

2.1.1 Responsible Persons

Table 2-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Carla Franklin	Sandy Nolan
Organization	SAIC	SAIC
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	827-4657	827-4652
Fax	825-4968	825-4968
LaRC email	c.b.franklin@larc.nasa.gov	s.k.nolan@larc.nasa.gov

2.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 2-1.

2.1.3 Parent PGE(s)

Table 2-2. Parent PGEs for CER4.5-6.2P1

PGEName	Description
CER4.5-6.1P1	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor

2.1.4 Target PGE(s):

N/A

2.2 Operating Environment

2.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 2-3. Runtime Parameters for CER4.5-6.2P1

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	00 .. 23

2.2.2 Environment Script Requirements

Reference "Proposal for Semi-Automated Sampling Strategy, Production Strategy, and Configuration Code Implementation" internal paper for detailed description of the CERES environment parameters. URL:http://asd-www.larc.nasa.gov/ceres/intern_doc/

One Environment Script, named '**ENVinversion-env.csh,**' is required. It is the same environment file used in CER4.5-6.1P1. The following Parameters are required:

> SS4_5   - Sampling Strategy for Inversion, see Production Request
> PS4_5   - Production Strategy for Inversion, see Production Request
> CC4_5   - Configuration Code for Inversion, see CM Database

2.2.3 Execution Frequency (daily,hourly,..)

hourly (1/hr) - This PGE is to be processed once per data-hour, a maximum total of 744 hours per month, when input is available.

2.2.4 Memory/Disk Space/Time Requirements

> Memory: 12832 K
> Disk Space: 360 Megabytes
> Total Run Time: 17 seconds

2.2.5 Restrictions Imposed in Processing Order

None, process when Input Data are available (see Section 2.3).

2.3 Processor Dependencies (Previous PGEs, Ingest Data,..)

2.3.1 Input Dataset Name (#1): SSFB

    a. Directory Location/Inputs Expected (Including .met files, header files, etc.)

        $CERESHOME/inversion/data/out_comp/data/
        CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

        1. Mandatory/Optional: **This file is Mandatory**

        2. Time Related Dependency:

            The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

        3. Waiting Period: **None, Process when all input data are available.**

    b. Source of Information (Source is PGE name or Ingest Source):

        Source PGE: CER4.5-6.1P1

    c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

    d. File Disposition after successful execution:

        Do not remove, will be needed for other PGE(s)

    e. Typical file size (MB): **205**

2.4 Operating Procedures (Procedure for each part of the processor's elements)

The Postprocessor production script, run_4.5-6.2P1, references a PCF which contains the correct file names and paths for PGE, CER4.5-6.2P1. This PCF is created by first sourcing the inversion-specific environment script, ENVinversion-env.csh, then executing an ASCII file generator, ascii_gen_4.5-6.2P1, and the PCF generator, pcfgen_4.5-6.2P1.

2.4.1 How to Generate the ASCII File

The ASCII file generator requires four command line arguments, 4-digit year (YYYY), 2-digit month (MM), 2-digit day (DD), and 2-digit hour-of-day (HH).

At the command line (>) type:

    > cd $CERESHOME/inversion/bin
    > source $CERESHOME/inversion/bin/ENVinversion-env.csh
    > $CERESHOME/inversion/bin/ascii_gen_4.5-6.2P1 YYYY MM DD HH

The following file will be generated in **$CERESHOME/inversion/rcf/**:

    CER4.5-6.2P1_PCFin_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

2.4.2 How to Generate the PCF File

The PCF generator, pcfgen_4.5-6.2P1, is executed using the newly created ASCII input file name as a command line argument.

At the command line (>) type:

> **> $CERESHOME/inversion/bin/pcfgen_4.5-6.2P1 CER4.5-6.2P1_
> PCFin_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

The following PCF will be generated in **$CERESHOME/inversion/rcf/**:

> **CER4.5-6.2P1_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

2.4.3 How to Execute the Main Processor

Execute the production script by typing the script name, run_4.5-6.2P1, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."Data Date".   The date parameter is formatted, YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day, and HH is the 2-digit hour-of-day.

At the command line (>) type:

> **> cd $CERESHOME/inversion/bin**
> **> $CERESHOME/inversion/bin/run_4.5-6.2P1**
> **$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

2.4.4 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

2.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the DAAC must take appropriate action. These files must be removed before reprocessing.

2.5 Execution Evaluation

2.5.1 Exit Codes

The processor CER4.5-6.2P1 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 2-4. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person for assistance (see Table 2-1).

Table 2-4. Exit Codes for CER4.5-6.2P1

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see Appendix B).

2.5.2 Screen Messages (Use Table format for large number of messages)

When running the production script, run_4.5-6.2P1, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

2.5.3 Log and Status Files Results (Include <u>ALL</u> Log Files)

The Log files contain any error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/inversion/data/runlogs**.

1. Report Log File: CER4.5-6.2P1_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Report Log File contains the Inversion related messages. These messages may be strictly informative (Error Type = Status or Warning) or may indicate a fatal condition that results in premature PGE termination (Error Type = Fatal). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in Appendix B.

2. Status Log File: CER4.5-6.2P1_LogStatus_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for "_F_", fatal message type. The responsible person should be advised.

3. User Log File: CER4.5-6.2P1_LogUser_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically the _U_ and _N_ (User information and Notice) will be written to User Log file and Status Log file.

2.5.4 Solutions to Possible Problems

As mentioned in Section 2.4.5, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the DAAC must take appropriate action. These files must be removed before reprocessing.

2.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

    a. Subsystem Termination

       There are no foreseeable Subsystem terminating conditions at this time. If one hour fails, continue processing the next hour.

    b. Target PGE Termination

       N/A

2.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 744 times, maximum, in a 31 day month.

Table 2-5. Expected Output File Listing for CER4.5-6.2P1

If "(**.met**)" is written next to an expected Output Filename in the following table, then the metatdata file **must** exist with the identical file name and .met extension.

File Name/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination
CER_SSF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met) @($CERESHOME/inversion/data/out_comp/data)	m	191.30	1/hr	N/A	Archive,rm

Note: hr   - data hour
rm   - remove
YYYY   - 4 digit year
MM   - 2 digit month {valid values: 01 .. 12}
DD   - 2 digit day {valid values: 01 .. 31
HH   - 2 digit hour of the day {valid values: 00 .. 23}
m   - mandatory output
o   - optional output

2.7 Expected Temporary Files/Directories.

Table 2-6. Temporary Files Listing for CER4.5-6.2P1

Directory	File Name
$CERESHOME/inversion/data/scr	MCFWrite.temp

APPENDIX A
Acronyms and Abbreviations

Appendix A
Acronyms and Abbreviations

CERES	Clouds and the Earth's Radiant Energy System
CM	Configuration Management
DAAC	Distributed Active Archive Center
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
HDF	Hierarchical Data Format
LaRC	Langley Research Center
LaTIS	Langley TRMM Information System
LW	Longwave
MB	Megabytes
met	metadata file
μm	microns
MOA	Meteorological, Ozone, and Aerosol
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File
PGE	Product Generation Executives
PSF	Point Spread Function
PRE_SSF	Preliminary Single Satellite CERES Footprint TOA and Surface Fluxes
QC	Quality Control
SAIC	Science Applications International Corporation
SSF	Single Satellite CERES Footprint TOA and Surface Fluxes, Clouds
SW	Shortwave
TOA	Top-of-Atmosphere
TRMM	Tropical Rainfall Measuring Mission
VD	Validation Days

APPENDIX B
Error Messages

Appendix B
Error Messages

Appendix B contains a list of messages that can be generated during the execution of PGEs CER4.5-6.1P1 and CER4.5-6.2P1. These messages are used to inform the operator or analyst of specific circumstances encountered during data processing. These messages may be strictly informative (Error Type = Status or Warning), or may indicate a fatal condition that results in premature PGE termination (Error Type = Fatal).   All messages are written to the LogReport file of the processing instance.

Table B-1 contains a list of the PGE CER4.5-6.1P1 diagnostic messages and Table B-2 contains a list of the PGE CER4.5-6.2P1 diagnostic messages. Each table entry includes a message number, the message content, the source module, the error type and the recommended action that should be taken when the message is encountered.

Operator Instructions:

If a PGE prematurely terminates, then take the following steps:

1. Look at the last few records on the LogStatus file.

2. Find the error message in the following Error Message listing(s), and follow the appropriate ACTION.

3. If an error message is not in the LogStatus File, then repeat steps 1 and 2 using the LogReport File.

4. If no information is derived, then call the responsible person inTable 1-1 or Table 2-1.

5. If the appropriate ACTION failed, then call the responsible person in Table 1-1 or Table 2-1.

6. In all cases, log all steps that were taken after the PGE failure, and send a copy to the responsible person listed in Table 1-1or Table 2-1.

Table B-1. PGE CER4.5-6.1P1 Error Messages (Sheet 1 of 2)

Message	Module Name	Error Type	Action
100: ERROR opening PRE_SSF file	start_mod	Fatal	Check PCF file for request name and location of SSFI file (Logic ID 101). Verify file exists in that location.
101: PRE-SSF QA Flag set to QA_FAIL	start_mod	Fatal	This hour should not be run while SSFI QA flag is set to FAIL.
102: ERROR in PRE_SSF header	start_mod	Fatal	Verify MOA file (Logic ID 102) is valid.
103: ERROR opening PRE_SSF QC file	start_mod	Fatal	Check PCF file for requested name and location of FQCI file (Logic ID 112). Verify file exists in that location.
104: ERROR reading in PRE_SSF QC record	start_mod	Fatal	Verify FQCI file (Logic ID 112) is valid.
105: ERROR in EARTH-SUN DISTANCE	start_mod	Fatal	Verify SSFI file (Logic ID 101) is valid.
106: ERROR opening SSF file	start_mod	Fatal	Check PCF file for requested name and location of SSFB file (Logic ID 201). Verify old file with the same name does not exist.
107: Unable to determine CERES instrument	start_mod	Warning	None.
108: MOA file open	start_mod	Status	None.
109: Unable to determine data month from SSF header	start_mod	Warning	None.
110: Unable to obtain Spcor model number from PCfile	start_mod	Fatal	Check PCF file (Logic ID 601).
111: Unable to obtain Surface algorithm flag from PCfile	start_mod	Fatal	Check PCF file (Logic ID 602).
112: ERROR opening MOA file	access_anc	Fatal	Check PCF file for requested name and location of MOA file (Logic ID 102). Verify file exists in that location.
113: ERROR READING MOA	access_anc	Fatal	Verify MOA file is valid (Logic ID 102).
114: MOA production date, YYYYMMDDHH not equal to MOA date on interim SSF - YYYYMMDDHH	access_anc	Warning	None: QA flag of SSFB will be marked SUSPECT.
115: ERROR in reading TOOLKIT file earthfigure.dat	access_anc	Fatal	Verify Toolkit file, earthfigure.dat, exists.
116: Reported surface area for FOV XX is YY percent (YY. > 100%)	scene_id_mod	Warning	None.
117: Reported surface area for FOV XX is 0 percent	scene_id_mod	Warning	None.
118: ERROR opening SCCOEF file	spcor_mod	Fatal	Check PCF file for request name and location of IISC** file (Logic ID 104). Verify file exists in that location.
119: ERROR reading SCCOEF file	spcor_mod	Fatal	Verify IISC** file (Logic ID 104) is valid.

B-2

Message	Module Name	Error Type	Action
120: Invalid Spectral Correction Algorithm Selected	spcor_mod	Fatal	Check PCF file for valid Spectral Correction model number (Logic ID 601).
121: ERROR reading from PRE-SSF file	process_fov_mod	Fatal	Verify SSFI file (Logic ID 101) is valid.
122: ERROR writing to SSF file	process_fov_mod	Fatal	Check for system problem.
123: END of FILE read on PRE-SSF file	process_fov_mod	Status	None.
124: NUMBER OF FOOTPRINTS READ, XX, NOT EQUAL TO NUMBER OF SSF FOOTPRINTS REPORTED ON INPUT SSF HEADER, YY	final_mod	Warning	None: QA flag of SSFB will be marked SUSPECT.
125: ERROR closing SSF file - no metadata written	final_mod	Fatal	Check for system problem.
126: ERROR writing the SSF QC record	final_mod	Fatal	Check for system problem.
127: ERROR closing SSF Bin QC file - no metadata written	final_mod	Fatal	Check for system problem.
128: ERROR closing SSF ASCII QC file - no metadata written	final_mod	Fatal	Check for system problem.

Table B-2. PGE CER4.5-6.2P1 Error Messages

Meassage	Module Name	Error Type	Action
200: SSF QA Flag set to QA_FAIL. HDF file will not be created.	ssf2hdf	Fatal	This hour should not be run while SSFB QA flag is set to FAIL.
201: subroutine ssf_tk_open could not open SSF file	ssf2hdf	Fatal	Check PCF file for request name and location of SSFB file (Logic ID 101). Verify file exists in that location.
202: problem closing the SSF file	ssf2hdf	Fatal	Check for system problem.
203: Could not open HDF file, XXX	ssf2hdf	Fatal	Check PCF file for request name and location of SSF file (Logic ID 102).
204: error initializing HDF file	ssf2hdf	Fatal	Check for system problem.
205: Unable to write header to HDF file	ssf2hdf	Fatal	Check for system problem.
206: Could not close , XXX	ssf2hdf	Fatal	Check for system problem.
207: error closing the HDF file	ssf2hdf	Fatal	Check for system problem.
208: Unable to write XXX SDS for YYY for record number ZZ	ssf2hdf	Fatal	Check for system problem.
209: Unable to read XXX SDS for YYY for record number ZZ	ssf2hdf	Fatal	Contact Analyst.
210: Invalid SDS number. Correct numbers are 1 through 24.	ssf2hdf	Fatal	Contact Analyst.

APPENDIX C
Sample Input File Listing for CER4.5-6.1P1 and CER4.5-6.2P1

C.1 Sample ASCII Input File Listing for CER4.5-6.1P1

```
##!/bin/tcsh -f
###########################################
#  ascii_gen_4.5-6.1P1
#
#  Inversion script which simulates LaTIS PGE-unique Preprocessor
#  and creates ASCII input file to test the PGE Generator for PGE
#  4.5-6.1P1.
#
#  The CERES Inversion environment variable script, ENVinversion-env.csh,
#  must be sourced before running this  script
#
#  This will be a LaTIS function and is provided here to
#  provide input for PGE Generator testing.
###########################################
#   The following parameters must be set on the command line:
#   $1 is the 4-digit data year
#   $2 is the 2-digit data month
#   $3 is the 2-digit data day
#   $4 is the 2-digit data hour of the day
#
# Example:  ascii_gen_4.5-6.1P1 1997 12 28 00
#
# The following environment variables are set by sourcing
# environment file ENVinversion-env.csh :
# $CCode4_5          - the Configuration Code for Subsysytems 4.5 and 4.6
# $CCode4_1          - the Configuration Code for Subsysytems 4.1 through 4.4
# $CCode12           - the Configuration Code for Subsysytem 12
# $outPS4_5           - Production Strategy for Subsysytems 4.5 and 4.6 output files
# $inPS4_1            - Production Strategy for input from Subsysytems 4.1 through 4.4
# $inPS12             - Production Strategy for input from Subsysytem 12
# $outSS4_5          - Sampling Strategy for Subsysytems 4.5 and 4.6 output files
# $inSS4_1           - Sampling Strategy for input from Subsysytems 4.1 through 4.4
# $inSS12            - Sampling Strategy for input from Subsysytem 12
# $SWsccr4_5         - Software SCCR number for Subsysytems 4.5 and 4.6
# $DATAsccr4_5        - Data SCCR number for Subsysytems 4.5 and 4.6
###########################################

set PGENam = 4.5-6.1P1

set CERYear = $1
set CERMon = $2
set CERDay = $3
set CERHrDay = $4
#
```

```
set SatInst = TRMM/PFM
set AncData = ERBE_ADMs
set SP_MODEL = 1
set SURF_ALG = 1

@ temp1 = ((($CERDay - 1) * 24) + $CERHrDay + 1)
set CERHrMon = $temp1

##################################################
# Create additional environment variables
##################################################
set INSTANCE_inv =
$outSS4_5$outPS4_5$CCode4_5˙$CERYear$CERMon$CERDay$CERHrDay
set INSTANCE_cld =
$inSS4_1$inPS4_1$CCode4_1˙$CERYear$CERMon$CERDay$CERHrDay
set INSTANCE_moa =
$inSS12$inPS12$CCode12˙$CERYear$CERMon$CERDay$CERHrDay

if ( -e $CERESHOME/inversion/rcf/CER4.5-6.1P1_PCFin_$INSTANCE_inv)
m $CERESHOME/inversion/rcf/CER4.5-6.1P1_PCFin_$INSTANCE_inv
touch $CERESHOME/inversion/rcf/CER4.5-6.1P1_PCFin_$INSTANCE_inv
set pcf_input = $CERESHOME/inversion/rcf/CER4.5-6.1P1_PCFin_$INSTANCE_inv
##################################################
# Create the ASCII input file for PCF generator
##################################################

echo "###########################"                  >>$pcf_input
echo "# CERES baseline Metadata">                   >>$pcf_input
echo "###########################"                  >> $pcf_input
echo "PGEName = $PGENam"                             >> $pcf_input
echo "SamplingStrategy = $outSS4_5"                 >> $pcf_input
echo "ProductionStrategy = $outPS4_5"               >> $pcf_input
echo "CERDataDateYear = $CERYear"                   >> $pcf_input
echo "CERDataDateMonth = $CERMon"                   >> $pcf_input
echo "CERDataDateDay = $CERDay"                     >> $pcf_input
echo "CERHrOfMonth = $CERHrMon"                     >> $pcf_input
echo "CERHrOfDay  = $CERHrDay"                      >> $pcf_input
echo "ConfigurationCode = $CCode4_5"                >> $pcf_input
echo "SWsccr = $SWsccr4_5"                          >> $pcf_input
echo "DATAsccr = $DATAsccr4_5"                      >> $pcf_input
echo ""                                             >> $pcf_input
echo "##################################"           >> $pcf_input
echo "# PGE specific runtime parameters"            >> $pcf_input
echo "##################################"           >> $pcf_input
echo "Satellite_Instrument = $SatInst"              >> $pcf_input
echo "Ancillary_Data_Set = $AncData"                >> $pcf_input
```

```
echo "SP_MODEL_NUM = $SP_MODEL"                          >> $pcf_input
echo "RUN_SURF_ALG = $SURF_ALG"                          >> $pcf_input
echo "TK_Ver = SCF B.0 TK5.2.1"                          >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# PCF required directories"                        >> $pcf_input
echo "###################################"               >> $pcf_input
echo "SS4.5_InputDir.1 = $CERESHOME/clouds/data/out_comp/data/SSF_Int" >>
$pcf_input
echo "SS4.5_InputDir.2 = $CERESHOME/clouds/data/out_comp/QA_Reports" >>
$pcf_input
echo "SS4.5_InputDir.3 = $CERESHOME/sarb/data/out_comp/data/regridmoa" >>
$pcf_input
echo "SS4.5_InputDir.4 = $CERESHOME/inversion/data/ancillary/static"  >> $pcf_input
echo "SS4.5_InputDir.5 = $CERESHOME/shared_data"  >> $pcf_input
echo "SS4.5_OutputDir.1 = $CERESHOME/inversion/data/out_comp/data"  >> $pcf_input
echo "SS4.5_OutputDir.2 = $CERESHOME/inversion/data/out_comp/QC"  >> $pcf_input
echo "SS4.5_LogsDir = $CERESHOME/inversion/data/runlogs"  >> $pcf_input
echo "SS4.5_MCFDir = $CERESHOME/inversion/rcf"  >> $pcf_input
echo "SS4.5_TempDir = $CERESHOME/inversion/data/scr"  >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# Input file names"                                >> $pcf_input
echo "###################################"               >> $pcf_input
echo "SS4.5_Inputfile.1 = CER_SSFI_$INSTANCE_cld"  >> $pcf_input
echo "SS4.5_Inputfile.2 = CER_FQCI_$INSTANCE_cld"  >> $pcf_input
echo "SS4.5_Inputfile.3 = CER_MOA_$INSTANCE_moa"   >> $pcf_input
echo "SS4.5_Inputfile.4 = IISCTRM.19980525"              >> $pcf_input
echo "SS4.5_Inputfile.5_1 = NIISW03.19971101"            >> $pcf_input
echo "SS4.5_Inputfile.5_2 = NIILWAT.19971101"            >> $pcf_input
echo "SS4.5_Inputfile.5_3 = NIILWWN.19971101"            >> $pcf_input
echo "SS4.5_Inputfile.5_4 = NIILWSP.19971101"            >> $pcf_input
echo "SS4.5_Inputfile.5_5 = NIILWSM.19971101"            >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# Output file names"                               >> $pcf_input
echo "###################################"               >> $pcf_input
echo "SS4.5_Outputfile.1 = CER_SSFB_$INSTANCE_inv"  >> $pcf_input
echo "SS4.5_Outputfile.2 = CER_GQCA_$INSTANCE_inv"  >> $pcf_input
echo "SS4.5_Outputfile.3 = CER_GQCI_$INSTANCE_inv"  >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# Log file names"                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo ""                                                  >> $pcf_input
echo "SS4.5_Logsfile.1 = CER4.5-6.1P1_LogStatus_$INSTANCE_inv"  >> $pcf_input
```

echo "SS4.5_Logsfile.2 = CER4.5-6.1P1_LogReport_$INSTANCE_inv" >> $pcf_input
echo "SS4.5_Logsfile.3 = CER4.5-6.1P1_LogUser_$INSTANCE_inv" >> $pcf_input
chmod 777 $pcf_input
echo $pcf_input

C.2   Sample ASCII Input File Listing for CER4.5-6.2P1


```
#!/bin/csh -f
###########################################
#  ascii_gen_4.5-6.2P1
#
#  Inversion script which simulates LaTIS PGE-unique Preprocessor
#  and creates ASCII input file to test the PGE Generator for PGE
#  4.5-6.2P1.
#
#  The CERES Inversion environment variable script, ENVinversion-env.csh,
#  must be sourced before running this script.
#
#  This will be a LaTIS function and is provided here to
#  provide input for PGE Generator testing.
###########################################
#   The following parameters must be set on the command line:
#   $1 is the 4-digit data year
#   $2 is the 2-digit data month
#   $3 is the 2-digit data day
#   $4 is the 2-digit data hour of the day
#
# Example:  ascii_gen_4.5-6.2P1 1997 12 28 00
#
# The following environment variables are set by sourcing
# environment file ENVinversion-env.csh :
#  $CCode4_5        - the Configuration Code for Subsysytems 4.5 and 4.6
#  $CCode4_1        - the Configuration Code for Subsysytems 4.1 through 4.4
#  $CCode12        - the Configuration Code for Subsysytem 12
#  $outPS4_5        - Production Strategy for Subsysytems 4.5 and 4.6 output files
#  $inPS4_1        - Production Strategy for input from Subsysytems 4.1 through 4.4
#  $inPS12        - Production Strategy for input from Subsysytem 12
#  $outSS4_5        - Sampling Strategy for Subsysytems 4.5 and 4.6 output files
#  $inSS4_1        - Sampling Strategy for input from Subsysytems 4.1 through 4.4
#  $inSS12        - Sampling Strategy for input from Subsysytem 12
#  $SWsccr4_5        - Software SCCR number for Subsysytems 4.5 and 4.6
#  $DATAsccr4_5       - Data SCCR number for Subsysytems 4.5 and 4.6
#  $TKVer        - Current Toolkit version
```

```
###############################################

set PGENam = CER4.5-6.2P1

set CERYear = $1
set CERMon = $2
set CERDay = $3
set CERHrDay = $4
#
set SatInst = TRMM/PFM
#set AncData = ERBE_ADMs
#set SP_MODEL = 1
#set SURF_ALG = 1

@ temp1 = ((($CERDay - 1) * 24) + $CERHrDay + 1)
set CERHrMon = $temp1

###################################################
# Create additional environment variables
###################################################
#set RUN = $CERYear$CERMon$CERDay$CERHrDay
set INSTANCE_inv =
$outSS4_5$outPS4_5$CCode4_5˙$CERYear$CERMon$CERDay$CERHrDay
#set INSTANCE_cld =
$inSS4_1$inPS4_1$CCode4_1˙$CERYear$CERMon$CERDay$CERHrDay
#set INSTANCE_moa =
$inSS12$inPS12$CCode12˙$CERYear$CERMon$CERDay$CERHrDay
set LogS    = "_LogStatus_"
set LogR    = "_LogReport_"
set LogU    = "_LogUser_"
if ( -e $CERESHOME/inversion/rcf/$PGENamPCFin$INSTANCE_inv )
m $CERESHOME/inversion/rcf/$PGENamPCFin$INSTANCE_inv
touch $CERESHOME/inversion/rcf/$PGENamPCFin$INSTANCE_inv
set pcf_input = $CERESHOME/inversion/rcf/$PGENamPCFin$INSTANCE_inv

###################################################
# Create the ASCII input file for PCF generator
###################################################

echo "###########################"              >> $pcf_input
echo "# CERES baseline Metadata"                >> $pcf_input
echo "###########################"              >> $pcf_input
echo "PGEName = $PGENam"                        >> $pcf_input
echo "SamplingStrategy = $outSS4_5"             >> $pcf_input
echo "ProductionStrategy = $outPS4_5"           >> $pcf_input
```

```
echo "CERDataDateYear = $CERYear"                        >> $pcf_input
echo "CERDataDateMonth = $CERMon"                        >> $pcf_input
echo "CERDataDateDay = $CERDay"                          >> $pcf_input
echo "CERHrOfMonth = $CERHrMon"                          >> $pcf_input
echo "CERHrOfDay  = $CERHrDay"                           >> $pcf_input
echo "ConfigurationCode = $CCode4_5"                     >> $pcf_input
echo "SWsccr = $SWsccr4_5"                               >> $pcf_input
echo "DATAsccr = $DATAsccr4_5"                           >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# PGE specific runtime parameters"                 >> $pcf_input
echo "###################################"               >> $pcf_input
echo "Satellite_Instrument = $SatInst"                   >> $pcf_input
#echo "Ancillary_Data_Set = $AncData"                    >> $pcf_input
#echo "SP_MODEL_NUM = $SP_MODEL"                         >> $pcf_input
#echo "RUN_SURF_ALG = $SURF_ALG"                         >> $pcf_input
echo "TK_Ver = SCF B.0 TK5.2.1"                          >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# PCF required directories"                        >> $pcf_input
echo "###################################"               >> $pcf_input
echo "SS4.5_InputDir.1 = $CERESHOME/inversion/data/out_comp/data"  >> $pcf_input
echo "SS4.5_OutputDir.1 = $CERESHOME/inversion/data/out_comp/data" >> $pcf_input
echo "SS4.5_LogsDir =  $CERESHOME/inversion/data/runlogs"    >> $pcf_input
echo "SS4.5_MCFDir = $CERESHOME/inversion/rcf"           >> $pcf_input
echo "SS4.5_TempDir = $CERESHOME/inversion/data/scr"    >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# Input file names"                                >> $pcf_input
echo "###################################"                >> $pcf_input
echo "SS4.5_Inputfile.1 = CER_SSFB_$INSTANCE_inv"     >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# Output file names"                               >> $pcf_input
echo "###################################"                >> $pcf_input
echo "SS4.5_Outputfile.1 = CER_SSF_$INSTANCE_inv" >> $pcf_input
echo ""                                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo "# Log file names"                                  >> $pcf_input
echo "###################################"               >> $pcf_input
echo ""                                                  >> $pcf_input
echo "SS4.5_Logsfile.1 = $PGENam$LogS$INSTANCE_inv" >> $pcf_input
echo "SS4.5_Logsfile.2 = $PGENam$LogR$INSTANCE_inv" >> $pcf_input
echo "SS4.5_Logsfile.3 = $PGENam$LogU$INSTANCE_inv" >> $pcf_input
chmod 777 $pcf_input
```